

MILK RIVER

WATERSHED NEWS

St. Mary Rehabilitation Project Advances on Several Fronts

*Paul Azevedo, Project Coordinator,
MT DNRC*

Thanks to the efforts of Senator Baucus, the Water Resources Development Act (WRDA) of 2007 includes a \$153 million federal authorization for rehabilitation of the St. Mary Diversion Facilities. Senator Tester and Rep. Rehberg also deserve our gratitude for their efforts in building support for the project among their Senate and House colleagues. The \$21 billion WRDA bill authorizes the Army Corps of Engineers to carry out hundreds of projects across the nation.

Inclusion of St. Mary's in WRDA is a major milestone in the overall rehabilitation effort. Every member of the St. Mary Rehabilitation Working Group is to be congratulated for their time and effort on behalf of the Milk River Basin. Over the last four years they have traveled hundreds of miles and sat through countless hours of meetings. Working Group co-chairs Lt. Governor John Bohlinger and Randy Reed and Executive Director Larry Mires have worked tirelessly to build support for the project both here in Montana and in the halls of Congress.

With the passage of WRDA the real work begins. WRDA simply authorizes the federal government,

through the Army Corps of Engineers, to expend up to \$153 million on rehabilitation of the St. Mary Diversion Facilities; it does not guarantee Congress will appropriate the money. The next step will involve

with the required 25% non-federal cost share.

If the last four years are any guide, the road ahead will be filled with unexpected twists and turns guaranteed to test everyone's patience and tenacity. Regardless of the bumps or obstacles encountered, the goal of rehabilitating the St. Mary Facilities remains the same.

To paraphrase Winston Churchill, do not waste energy arguing about the difficulties. The difficulties will argue for themselves.

Over the past seven months the State's contractor, TD&H Inc. of Great Falls, has been actively collecting base-line technical data required for preliminary engineering activities. TD&H is currently wrapping up work on a detailed topographic survey along the 29-mile canal route. The new maps will be the most detailed topographic information available for the project site.

This survey project provided an opportunity for TD&H to team with surveyors from the Blackfeet Tribal Land Department. Funding for the survey was provided by DNRC and the Bureau of Reclamation.



Chief Mountain

DNRC Photo

working with all three members of Montana's Congressional Delegation to secure federal funding for the project. At the local and state level, there is the challenge of coming up

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In July, TD&H drilled and installed a test pump well and one observation well on the south-east (down stream) slope of the St. Mary siphon crossing. TD&H also collected core samples from the underlying bedrock. After installation, the well was pumped while instruments measured the change in elevation of the groundwater table at the observation well and adjacent piezometers. TD&H will use data collected from the pump test in the design of a drainage system to dewater and stabilize the slope. Once installed, the dewatering system will provide the immediate benefit of stabilizing the slope beneath the current siphon supports as well as getting a head start on slope stabilization in preparation for the new siphons. Funding for the core sampling was provided by Reclamation.

Engineers from DNRC, TD&H, and Reclamation also spent several days

conducting a geotechnical evaluation of 15 areas adjacent to the canal that have been long plagued by slope instabilities. The goal of this investigation is to get a better estimate on the aerial extent of the unstable areas, the depth of the failure plane, and the mechanism of failure. Since the cost of stabilizing the slopes at these sites will be directly related to the amount of dirt that must be moved to get the job done, slope stabilization plans will focus on minimizing the amount of earth work.

Engineers from Reclamation, DNRC, and TD&H are also conducting a seepage analysis along the 29 mile canal route. The data collected will allow the engineering team to undertake a cost/benefit analysis when it comes times to decide whether or not to include canal lining in the final design. Given the high per mile cost of canal lining its

use will probably be limited to those sections with high seepage loss.

TD&H also completed a structural evaluation of all bridges that cross the canal. The purpose of this task is to inventory and characterize the existing bridges in order to evaluate potential conflicts and impacts from overall canal rehabilitation.

On September 25-26, representatives from Reclamation, DNRC, the Blackfoot Tribe, TD&H and the St. Mary Working Group conducted an in-depth field review of the St. Mary system for the St. Mary diversion dam to Drop #5. This was a boots on the ground examination of potential failure scenarios at critical points along the canal route. Information collected will be used in developing contingency plans in the event of a catastrophic failure prior to completion of the rehabilitation.

Water Resources Development Act of 2007 Conference Report to Accompany HR1495 July 31, 2007

SEC. 5103. ST. MARY PROJECT, GLACIER COUNTY, MONTANA.

- (a) **IN GENERAL** – The Secretary, in consultation with the Bureau of Reclamation, shall conduct all necessary studies, develop an emergency response plan, provide technical and planning and design assistance, and rehabilitate and construct the St. Mary Diversion and Conveyance Works project located within the exterior boundaries of the Blackfoot Reservation in the State of Montana, at a total cost of \$153,000,000.
- (b) **FEDERAL SHARE** – The Federal share of the total cost of the project under this section shall be 75 percent.
- (c) **PARTICIPATION BY BLACKFEET TRIBE AND FORT BELKNAP INDIAN COMMUNITY** –
 - (1) **IN GENERAL** – Except as provided in paragraph (2), no construction shall be carried out under this section until the earlier of –
 - (A) the date on which Congress approves the reserved water rights settlements of the Blackfoot Tribe and the Fort Belnap Indian Community; and
 - (B) January 1, 2011.
 - (2) **EXCEPTION** – Paragraph (1) shall not apply with respect to construction relating to –
 - (A) standard operation and maintenance; or
 - (B) emergency repairs to ensure water transportation or the protection of life and property.
 - (3) **REQUIREMENT** – The Blackfoot Tribe shall be a participant in all phases of the project authorized by this section.

Preventive Medicine: Catastrophic Failure Planning

Mike Dailey, MT DNRC

On September 25 & 26, engineers, water resource planners and technicians converged on Babb to assess the St. Mary Facilities for modes and likelihood of failure as part of an effort to develop a catastrophic failure plan.



Catastrophic Failure Planning Team members offer scale to the outlet transition of the Halls Coulee Siphon.

Photo by John Sanders, DNRC

The thought of failure planning seems somewhat abstract: such is the nature of planning, but rising O&M costs are quite tangible, and emergencies are often overwhelming and costly to mitigate. Planning is tough to justify, especially if nothing goes wrong, but ignoring the threat would be nothing short of negligence.

The main ideas behind catastrophic failure planning are to: 1.) Minimize the risk of a catastrophic failure; 2.) Have a plan in place should a failure occur; and 3.) Minimize risks to life, property, environment and economy.

Other components that play into failure severity are timing, duration, repair cost and antecedent conditions. For example, the impacts of losing St. Mary diversions for a month during the early part of a wet spring is not near as severe as losing it during a hot, dry spring.

Finally a prioritization based on the integrity of each structure and canal reach and the risks each structure poses needs to be analyzed. By analyzing all these risk factors, a picture begins to emerge of where you get the biggest bang for your buck. This kind of planning gives you a playbook on where money

will be best spent. It also identifies critical areas where preventive measures should be employed, where it is prudent and permissive to be reactive, aids efficient decision making, and minimizes downtime.

Rehabilitation Working Group (SMRWG) mantra, "Failure is not an option," holds the dual meaning of securing federal assistance and keeping the wheels on the facilities until the rehabilitation transpires. The question that often arises is how much do we invest in facilities that are going to be replaced? That question is unanswerable without a plan. What we know is the existing infrastructure must remain viable for an indefinite period of time, which will require some gymnastics to keep the water flowing while reducing failure risks, and keeping a bridle on O&M costs. This is the dilemma facing project irrigators, Reclamation and the SMRWG.



Erling Juel, civil engineer with Thomas, Dean & Hoskins, Inc., shows the Catastrophic Failure Planning Team a proposed St. Mary Canal Reroute.

Photo by Mike Dailey, DNRC

Although the Water Resource Development Act (WRDA) was passed by Congress, authorizing the St. Mary rehabilitation (See related article), actual construction appears to be many years down the road, which leaves the project exposed to a potential catastrophic failure, and therefore a need to plan against it. The St. Mary

There are two ways to approach maintenance of the existing facilities: preventive and reactive. Neither preventive nor reactive measures are standalone remedies. A strictly preventive approach would be cost prohibitive while a strictly reactive approach would be irresponsible. A deliberate combined approach, while keeping an eye on progress toward

rehabilitation, needs to be employed.

I would argue that structures most likely to fail catastrophically, meaning a failure that threatens life, property, environment and economy, should be avoided first and foremost and addressed in a preventive manner. Structures likely to fail, but pose little risk or impact as described above, should be planned on how to quickly address the problem when and if it occurs. Had a significant event occurred during the last irrigation season, managers and personnel would have been scrambling to deal with the aftermath.

In September, the Catastrophic Planning Team, looking at the St. Mary facilities through fresh eyes, saw decrepit and threatened structures, but the threat is manageable through planning. A draft document being developed by Thomas, Dean & Hoskins, Inc. summarizing structural observations will be released some time in November 2007. It will serve as the key reference to developing a planning guide ultimately geared to stave off a catastrophic failure while we move toward rehabilitation.

I strongly recommend that a catastrophic failure plan be developed and implemented prior to the 2008 irrigation season. As the old adage goes: "An ounce of prevention..."



A new slip joint sits ready to be installed on the Halls Coulee Siphon.
Photo by John Sanders, DNRC



A steel plaque mounted on the St. Mary Siphon Bridge serves as a blunt reminder to the age of the St. Mary Facilities.

Photo by Mike Dailey, DNRC



Crews work against the clock to replace slip joints on the Halls Coulee Siphon before the onset of winter.

Photo by Mike Dailey, DNRC

Checkout these Websites:

<http://picasaweb.google.com/josandersatmt.gov>
See pictures of the St. Mary Drops and Siphons.

<http://www.usbr.gov/dataweb/html/milkriver.html>
Search for Milk River Project data.

<http://www.familyfarmalliance.org>
Grass roots advocate for family farming and ranching.

http://dnrc.mt.gov/st_mary
Stay abreast to St. Mary rehabilitation activities.

<http://water.montana.edu/watersheds>
A clearing house for watershed information in Montana.

<http://dnrc.mt.gov/rwrcc/Compacts/blackfeet>
View the latest proposed Blackfeet Reserved Water Rights Compact.

Update on Investigations at Nelson Dikes

Steve Davies, Bureau of Reclamation
October 12, 2007

The Bureau of Reclamation has completed the field investigations program of the outlet works and embankment sections at Nelson Dikes. The investigations, which were conducted through Reclamation's Safety of Dams Program, were initiated following the completion of a Comprehensive Facility Review (CFR) of the structures in 2005. CFR's are Reclamation's highest level of structural review and performed at facilities such as Nelson Dikes at least once every 6 years. In addition to a thorough examination of the structures, this type of review includes an evaluation of how the structures were originally designed and constructed, as compared to state-of-the-art requirements for how dams are designed and constructed today. Information collected from the investigations will be used to help evaluate the current condition of the concrete outlet conduits and earthen materials in the dikes. Nelson Dikes was constructed in 1914-1915 and enlarged in 1921-1922.



Reclamation drill crew drilling on the crest of Nelson Dike DA in the vicinity of the South Outlet Works Structure in November 2006.

Photo by David Scanson, Reclamation's MT Area Office

Specific activities completed at the dikes included performing detailed inspections, core drilling and geophysical surveying inside the north and south outlet works structures; installation of 10 new instruments within the conduits to measure water pressures behind the concrete lining; installation of 32 new survey points within the conduits for future monitoring; and drilling 11 exploratory drill holes in the embankment sections of Dikes DA and C to obtain water level information and material samples for testing and analysis. The work was conducted with the assistance of the Malta Irrigation District. No impacts to reservoir operations occurred while the investigations were ongoing.

Information obtained from the field investigations is currently being evaluated, with final results of the

Drilling on the crest of Nelson Dike DA in the vicinity of the South Outlet Works Structure in November 2006.

Photo – David Scanson



Reclamation drill crew drilling inside the left outlet conduit of the North Outlet Works in March 2006 (discharges to Nelson North Canal).

Photo by David Scanson, Reclamation's MT Area Office

program scheduled to be completed in 2008. Reclamation will present the final results of the investigations program to the Malta and Glasgow Irrigation Districts and the Milk River Joint Board of Control.

Representatives on the Milk River JBC:

Kay Blatter
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Wade Jones
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Wes Pankratz
Ralph Snider
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Dodson Irr. Dist.



Milk River Water Supply

Jeremy Giovando, Bureau of Reclamation
October 10, 2007; updated November 25

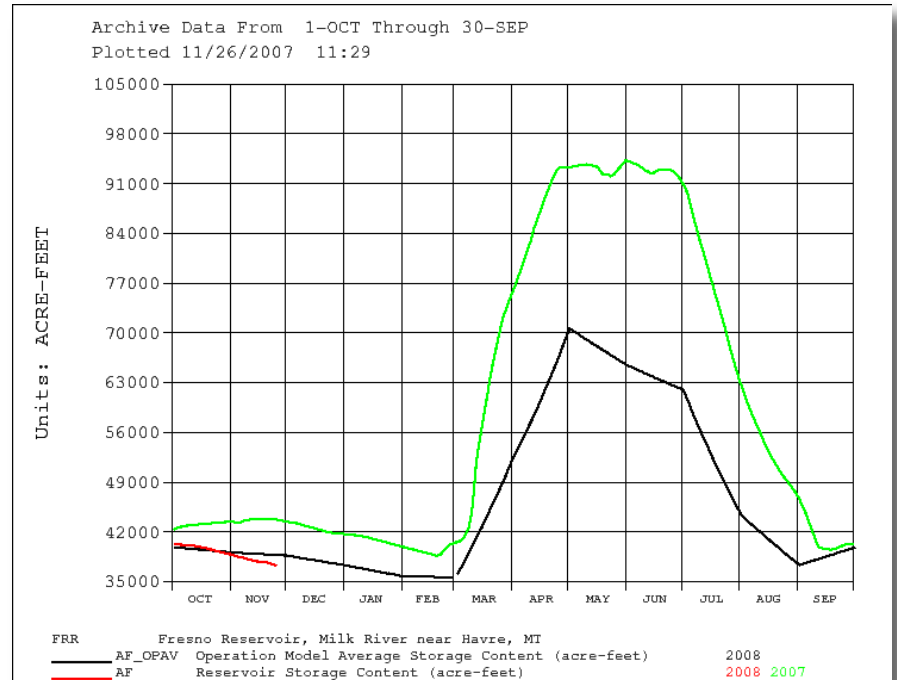
Total storage for the Milk River Project is near average for this time of year. Storage for Lake Sherburne, Fresno and Nelson Reservoirs are 133, 96 and 91 percent average, respectively. Releases from Lake Sherburne as well as the diversions to the St. Mary Canal were discontinued on September 4. Fresno releases were decreased to the winter flow rate of 40-45 cfs on September 28. Diversions from the Milk River to Nelson Reservoir continued through mid-October and averaged approximately 80 cfs during that time period.

The 2007 irrigation season was a great example of how important reservoir storage is during drought. Water users were allotted near normal volumes for irrigation even though the inflows to Sherburne and Fresno Reservoirs were much below average. This is primarily due to the excellent storage at the beginning of the season. For example, April through September inflows to Lake Sherburne were only 90,000 acre-feet, 76 percent of average, however Lake Sherburne storage prior to diverting water to the Milk River was nearly 200 percent of normal. This resulted in the total water diverted for the season through the St. Mary Canal being approximately 171,000 acre-feet, which is 103 percent of average. Similarly the inflow to Fresno Reservoir during April through September was only 164,000 acre-feet or 74 percent of average, while releases totaled approximately 199,000 acre-feet or 83 percent of average. The difference being provided from stored water. The overall effect of the low streamflows was seen in late summer when storage in Lake Sherburne was significantly depleted in order to maintain diversions to the St. Mary Canal. This resulted in a much earlier than normal shutdown for the St. Mary basin facilities.

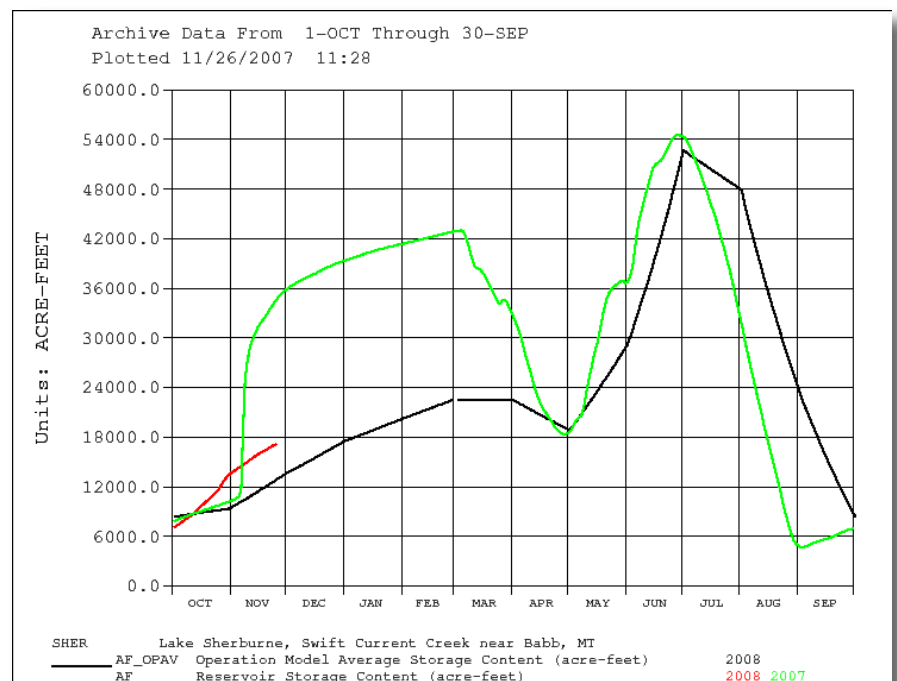
Storage as of November 25, 2007

| Reservoir | Storage (acre-feet) | % Normal | % Full |
|-----------------|---------------------|----------|--------|
| Lake Sherburne | 17,200 | 133 | 26 |
| Fresno | 37,300 | 96 | 40 |
| Nelson (active) | 35,000 | 91 | 60 |

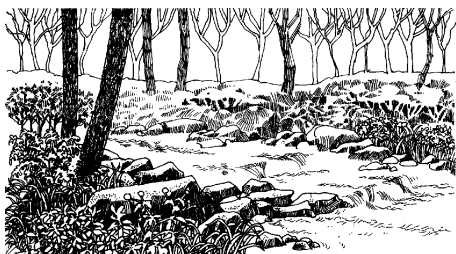
Fresno Reservoir Storage



Lake Sherburne Storage



The outlook for the water supply in 2008 is wide-ranging. Streamflows in both the St. Mary and Milk River basins continue to be much below average, however early fall precipitation appears to be tracking near average. The snowpack above Lake Sherburne is much below average for this time of year, although it is very early in the snow season to forecast possible water supply conditions for next year. Reclamation will continue to monitor the hydrologic conditions and beginning in January snowmelt runoff forecasts will be provided to water users.



Nelson Reservoir Low Water Boat Ramp

Reclamation's Montana Area Office, Phillips County, and the Malta Chapter of Walleyes Unlimited are working together to develop a concrete low water boat ramp at Nelson Reservoir. The ramp will be located in the northeastern corner of the reservoir in an area that is currently informally used as a boat launch site during periods of low water.

Reclamation is required by law to enter into management agreements with "non-Federal public bodies" to enhance or create new recreational developments, such as this new boat ramp at Nelson Reservoir. Examples of "non-Federal public bodies" would be State, County or City government entities.

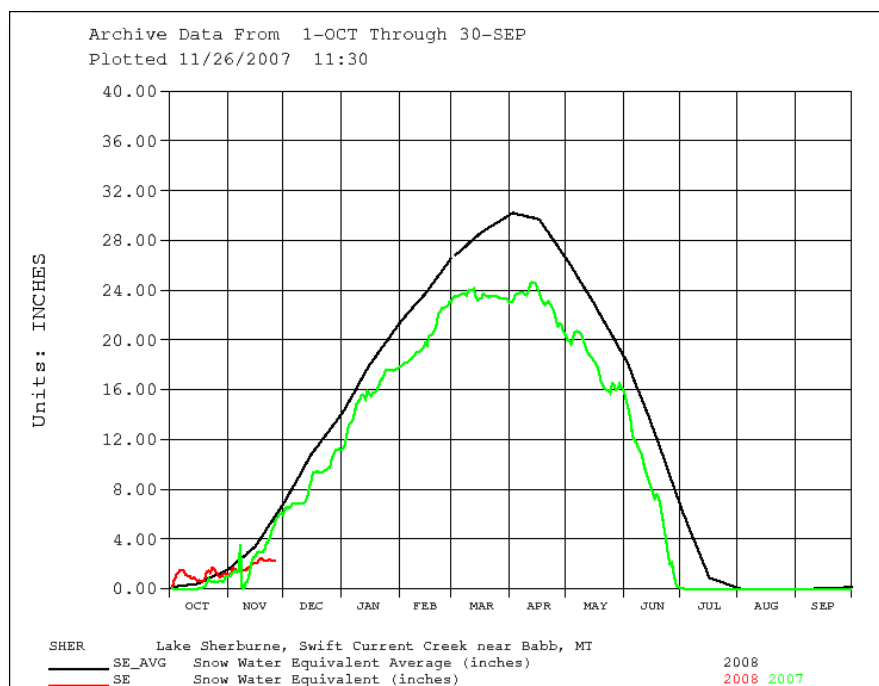
The Montana Area Office has entered into a Memorandum of Understanding (MOU) with Phillips County for construction of the boat ramp and associated parking facilities. The project will be funded by the Malta Chapter of Walleyes Unlimited whose members have been pursuing this project for several years. The group held successful fundraisers and received support

from anglers throughout Montana for the upcoming construction project. Construction of the ramp is anticipated to begin this fall; however the actual date of construction is dependent on water levels in the reservoir.

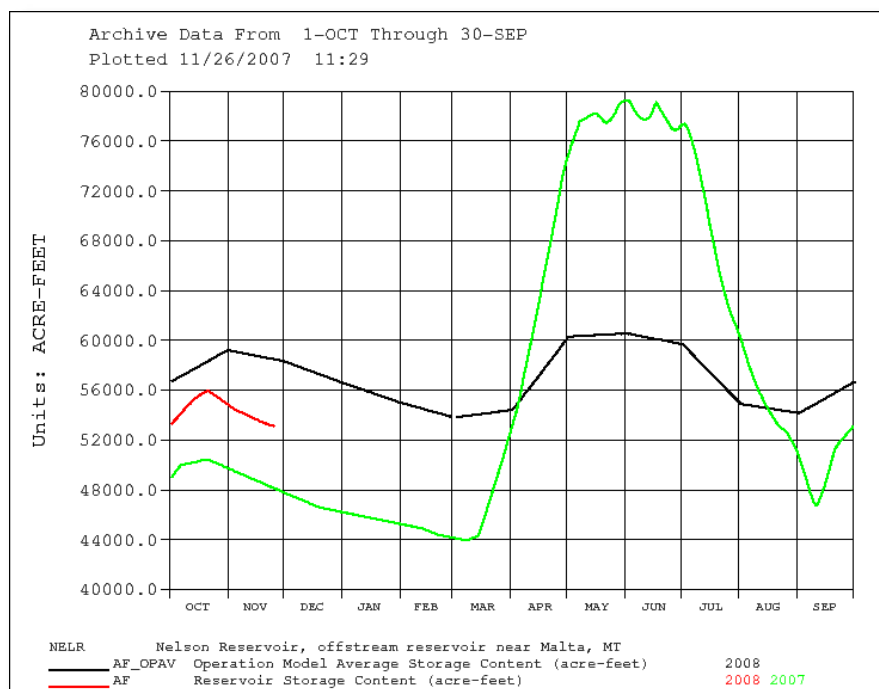
This project has been made possible through the hard work and dedication of the Malta

Chapter of Walleyes Unlimited and through support from the Phillips County Commissioners, the Malta Irrigation District, and the Bureau of Reclamation. The boat ramp will provide the benefit of enhanced access to Nelson Reservoir for boating and fishing, especially during periods of low water.

Snowpack Above Lake Sherburne



Nelson Reservoir Storage



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